B1 wherein said transformer control device discharges said capacitor until the voltage of said capacitor is substantially equal to said maximum voltage of said battery.

(A copy of the marked-up version of amended claim is attached to this Amendment.)

REMARKS

Reconsideration and allowance of this application are respectfully requested in view of the above amendment and the discussion below.

Applicants' invention has been discussed in the amendment filed April 9, 2002, which is incorporated herein by reference with the following additional comments being made in light of the above amendment and the present rejection.

Claims 3-6 are now rejected under 35 U.S.C. 102 based on the newly cited reference to Nomura et al., U.S. Patent No. 5,446,365, for the reasons indicated at item 2 of the Office Action. The '365 reference has been cited for teaching a device for supplying electricity to a motor vehicle including a chargeable battery 6, a voltage transformer 25 and a capacitor 21 for charging the battery. Furthermore, the reference has been cited for showing a discharge of the energy accumulator (capacitor) until the voltage of the accumulator is substantially equal to the nominal battery voltage, with reference being made to column 4, lines 7-56.

In response to this rejection, Applicants have amended independent claim 3 in order to more clearly define that the transformer functions to discharge the capacitor until the voltage of the capacitor is substantially equal to the maximum voltage of the battery. The object of the present invention is to provide an improved

system for supplying electricity to a motor vehicle so that excess energy, available for a short time, can be effectively used to charge the vehicle battery. Furthermore, the service life of the rechargeable vehicle battery can be increased.

According to the claimed invention, the charging of the battery is controlled by a voltage transformer so that the charged capacitor is discharged until the capacitor voltage is substantially equal to the voltage of the battery. Thus, this voltage transformer is only required to carry out a discharge or "downward" transformation starting from the capacitor voltage. Because this voltage transformer only needs to operate in "one direction," it can be constructed at reasonable cost. Independent claim 1 provides that the voltage transformer control device discharges the capacitor until the voltage of the capacitor substantially equals the maximum voltage of the battery.

Independent claim 5 defines a method wherein the discharging of the energy accumulator occurs until the voltage of the accumulator is substantially equal to the voltage of the rechargeable battery. Claim 5 also recites that the energy accumulator has a maximum voltage which is substantially greater than the nominal voltage of the battery.

Independent claim 6 is addressed to a recharging system for improving the service life of a rechargeable battery, which includes an energy accumulator having a first nominal voltage greater than the maximum voltage of the rechargeable battery and a means, connected between the energy accumulator and the rechargeable battery, to discharge the energy accumulator until the first nominal

voltage has been reduced to a voltage having a value substantially equal to the maximum voltage of the rechargeable battery.

Each of independent claims 3, 5 and 6 thus provide a structure or a method of operation which is not taught or suggested from the newly applied Nomura et al. reference. Applicants respectfully disagree with the Examiner's assertion that the '365 reference has a showing of "discharging said energy accumulator until the voltage of said accumulator is substantially equal to said nominal voltage (column 4, lines 7-56)." Column 4, only indicates that, when the charging voltage of the capacitor 21 becomes higher than the voltage of the battery 6, the charging current flows to the battery 6 through the switch element 23. However, a reading of column 5, lines 9-67 in conjunction with the showing of Fig. 3, clearly shows that the capacitor voltage V_c is increased until a time t_4 when the car stops. It also indicates that if the voltage V_c of the capacitor 21 exceeds the rated voltage V_h of the main circuit, the regeneration power is discharged by resistors so that the voltage V_c is limited below the rated V_h of the main circuit. Contrary to the statement in the rejection, the voltage is not limited to be substantially equal to the voltage of the battery 6, shown in Figure 3 as voltage V_b. It can be easily appreciated that Fig. 3 and the accompanying description at column 5 clearly shows that V_c is not intentionally discharged until it reaches the value V_1 (V_b). Instead the voltage V_c of the capacitor 21 is increased whenever a deceleration operation begins.

Thus, the '364 reference fails to have any disclosure concerning the specific required step or apparatus by which the capacitor is discharged until the voltage of the capacitor is substantially equal to the voltage of the battery.

This limitation, which is not available from the '365 reference, is specifically addressed to the manner in which the present invention is designed to improve over the prior art and therefore, such distinction is not an obvious variation to one of ordinary skill in the art.

Therefore, Applicants respectfully request that this application containing Claims 3-6, including independent Claims 3, 5 and 6 be allowed and be passed to issue.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #951/48911).

Respectfully submitted,

Date: **September 4, 2002**

Jeffrey D. Sanok
Registration No. 29,004

CROWELL & MORING, LLP
P.O. Box 14300
Washington, DC 20044-4300
Telephone No.: (202) 624-2500
Facsimile No.: (202) 628-8844

JDS/leb

VERSION WITH MARKINGS TO SHOW CHANGES MADE

3. (Amended) A device for supplying electricity to a motor vehicle, comprising:

a chargeable battery;

a voltage transformer control device having a first end connected to said chargeable battery;

a capacitor for charging said chargeable battery connected to a second end of said voltage transformer control device wherein the maximum voltage of said capacitor has a value which is greater than a maximum voltage of said battery and wherein said transformer control device discharges said capacitor until the voltage of said capacitor is substantially equal to said maximum voltage of said battery.